

IN THE CLAIMS

Please amend the claims as set forth below. Please cancel claims 1-26 without prejudice or disclaimer. Applicants reserve the right to file one or more continuation or divisional applications directed to the canceled subject matter.

Please add new claims:

Claims

Claims 1-26 (canceled)

Claim 27. (newly added) A process comprising:

(a) providing wastewater having at least reduced levels of carbonate and ammonium buffers, and at least reduced levels of suspended solids to a reactor vessel, and

(b) adding an alkaline earth base to said wastewater to precipitate soluble phosphate.

Claim 28. (Newly added) The process of claim 27 wherein said alkaline earth base is selected from the group consisting of calcium hydroxide, magnesium hydroxide, calcium oxide, magnesium oxide, and mixtures thereof.

Claim 29. (Newly added) A process comprising:

(a) providing a nitrified wastewater having at least reduced levels of suspended solids to a reactor vessel,

(b) adding an alkali to said nitrified wastewater to increase pH of said nitrified wastewater to at least about pH 9, and

(c) adding a metallic-containing salt or hydroxide to said wastewater having a pH of at least about pH 9 to precipitate

phosphate.

Claim 30. (Newly added) The process of claim 27 further comprising recovering said phosphate.

Claim 31. (Newly added) The process of claim 29 wherein said metallic-containing salt or hydroxide is an alkaline earth metal-containing salt or hydroxide.

Claim 32. (Newly added) A process comprising:

- (a) providing nitrified wastewater to a reactor vessel,
- (b) adding an alkali to said nitrified wastewater to increase pH of said nitrified wastewater to at least about pH 9, and
- (c) adding a metallic-containing salt or hydroxide which is an alkaline earth metal-containing salt or hydroxide selected from the group consisting of calcium, magnesium, and mixtures thereof.

Claim 33 (Newly added) A process comprising:

- (a) providing nitrified wastewater to a reactor vessel,
- (b) adding an alkali to said nitrified wastewater to

increase pH of said nitrified wastewater to at least about pH 9, and

(c) adding a metallic containing salt or hydroxide selected from the group consisting of sodium, potassium, and mixtures thereof to said wastewater having a pH of at least about 9 to precipitate phosphate.

Claim 34. (Newly added) A process for removing soluble phosphorus from animal wastewater comprising:

(a) providing wastewater to a nitrification reactor vessel to produce a clarified nitrified wastewater,

(b) flowing said nitrified wastewater to a separate reactor vessel and adding alkali to said nitrified wastewater to increase the pH of said nitrified wastewater to at least pH 9, and

(c) adding calcium or magnesium salts or hydroxide to precipitate soluble phosphorus to produce an effluent with a predefined nitrogen:phosphorus ratio.

Claim 35. (Newly added) The process of claim 34 wherein alkali and calcium or magnesium salts or hydroxide are added at rates to produce an effluent having a nitrogen:phosphorus ratio which meets the needs of a specific crop.

Claim 36. (Newly added) The process of claim 34 wherein alkali and calcium or magnesium salts or hydroxides are added at rates to produce an effluent having a nitrogen:phosphorus ratio to remediate phosphorus contaminated spray fields.

Claim 37. (Newly added) The process of claim 34 comprising using said effluent for surface or subsurface irrigation.

Claim 38. (Newly added) A process for removing soluble phosphorus from animal wastewater comprising:

(a) providing wastewater to a nitrification reactor vessel to produce nitrified wastewater,

(b) flowing said nitrified wastewater to a separate reactor vessel and adding alkali to said nitrified wastewater to increase the pH of said nitrified wastewater to at least about pH 9,

(c) adding calcium or magnesium salts to precipitate soluble phosphorus to produce an effluent with a predefined nitrogen:phosphorus ratio, and

(d) using said effluent in a constructed wetland to facilitate denitrification of said effluent.

Claim 39. (Newly added) A process for at least reducing the

presence of infectious microorganisms in wastewater comprising:

(a) providing wastewater to a nitrification reactor vessel to produce clarified, nitrified wastewater, and

(b) flowing said nitrified wastewater to a separate reactor vessel and adding alkali to said nitrified wastewater to increase the pH of said nitrified wastewater to at least pH 9 and at least reducing the presence of infectious microorganisms.

Claim 40. (Newly added) The process of claim 39 further comprising adding calcium or magnesium salts or hydroxide to precipitate soluble phosphorus to produce an effluent with a predefined nitrogen:phosphorus ratio and at least reduce levels of infectious microorganisms.

Claim 41. (Newly added) A process for at least reducing the presence of infectious microorganisms in wastewater comprising:

(a) providing wastewater to a nitrification reactor vessel to produce nitrified wastewater,

(b) flowing said nitrified wastewater to a separate reactor vessel and adding alkali to said nitrified wastewater to increase the pH of said nitrified wastewater to at least pH 9 and at least reducing the presence of infectious microorganisms,

(c) adding calcium or magnesium salts or hydroxide to precipitate soluble phosphorus to produce an effluent with a predefined nitrogen:phosphorus ratio and at least reduce levels of infectious microorganisms, and

(d) flowing said effluent into a constructed wetland.

Claim 42. (Newly added) A process for at least reducing the presence of infectious microorganisms in wastewater comprising:

(a) providing wastewater to a nitrification reactor vessel to produce clarified, nitrified wastewater, and

(b) flowing said nitrified wastewater to a separate reactor vessel and adding alkali to said nitrified wastewater to increase the pH of said nitrified wastewater to at least pH 9 and at least reducing the presence of infectious microorganisms selected from the group consisting of enteropathogenic bacteria, picarnovirus, and mixtures thereof.

Claim 43. (Newly added) A system for wastewater treatment comprising:

(a) a primary settling unit,

(b) an aeration unit in fluid communication with said primary settling unit,

(c) a nitrification bioreactor unit in fluid communication with said aeration unit, and

(d) a phosphorus separation unit in fluid communication with said nitrification bioreactor unit.

Claim 44. (Newly added) The system of claim 43 further comprising a sedimentation unit in fluid communication with said aeration unit and said nitrification bioreactor unit.

Claim 45. (Newly added) The system of claim of claim 43 wherein said primary settling unit is a lagoon.

Claim 46. (Newly added) A system for wastewater treatment comprising:

- (a) a solid separation unit,
- (b) an aeration unit in direct fluid communication with a clarified effluent of said solid separation unit,
- (c) a nitrification bioreactor in direct fluid communication with said aeration unit, and
- (d) a phosphorus separation reactor unit in fluid communication with a liquid effluent from said nitrification bioreactor.

Claim 47. (Newly added) The system of claim 46 wherein flocculants are used in said solid separation unit to clump suspended solids and increase separation efficiency of said separation unit.

Claim 48. (Newly added) The system of claim 46 further comprising a sedimentation unit in fluid communication with said aeration unit and said nitrification bioreactor unit.

Claim 49. (Newly added) A system for wastewater treatment comprising:

- (a) a solid separation unit,
- (b) a denitrification unit in direct fluid communication with a clarified effluent from said solid separation unit,
- (c) a nitrification unit in fluid communication with said denitrification unit, and
- (d) a phosphorus separation reactor unit in fluid communication with a liquid effluent from said nitrification unit.

Claim 50. (Newly added) The system of claim 49 further comprising a clarification unit in fluid communication with said

nitrification unit and said phosphorus separation unit.

Claim 51. (Newly Added) The system of claim 49 wherein flocculants are used in said separation unit to clump suspended solids and increase separation efficiency of said separation unit.